

HEART VESSEL COUPLING IN SUBJECT WITH RISK FACTORS: A LONGITUDINAL LEFT VENTRICULAR FUNCTION AND ARTERIAL STIFFNESS STUDY

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Background: Reduction of longitudinal left ventricular (LLV) function represents an early stage of LV systolic dysfunction. We are not aware about data concerning the coupling between left ventricle and vessels in this early pathophysiological phase. In our study we evaluated the relationship between LV longitudinal systolic function and arterial stiffness parameters in subjects with traditional risk factors.

Methods: We studied 46 subjects (35 males, age 55 ± 12), without history of cardiac disease and with one or more traditional risk factors. All subjects with normal ejection fraction (EF), were divided in two groups in relation to the LLV function, evaluated by TDI as velocity of septal segment of mitral annulus: n (normal) group (33 subjects, 27 M) with normal longitudinal systolic function (LSF) ($S \geq 10$ cm/sec), p (pathological) group (13 subjects, 8 M) with reduced LSF ($S < 10$ cm/sec). We evaluated the stiffness parameters (Pulse wave velocity -PWV, elastic modulus - Ep, augmentation index - AI, stiffness-Beta) through the study of carotid artery using a new software "E-tracking", Aloka-Japan. Statistical analysis was performed with Anova. A p value < 0.05 was considered statistically significant.

Results: There was a significant difference between stiffness parameters in patients with normal or abnormal LSF, for each evaluated parameter: Beta $10,34 \pm 4,09$ (CI 8,903 - 11,779) vs. $14,23 \pm 5,98$ (CI 10,884 - 17,557) ($p < 0.05$); Ep $144,92 \pm 66,61$ (CI 121,55 - 168,29) vs. $195,57 \pm 83,157$ (149,1 - 242,06) ($p < 0.05$); AI $19,68 \pm 12,48$ (CI 15,3 - 24,06) vs. $29,23 \pm 14,27$ (21,177 - 37,3) ($p < 0.05$); PWV $7,08 \pm 1,52$ (CI 6,55 - 7,62) vs. $8,21 \pm 1,71$ (CI 7,25 - 9,17) ($p < 0.05$).

Conclusions: The coupling left ventricle/vessels is a new pathophysiological aspect in the development of LV systolic dysfunction. We observed a significant increase of vessel stiffness parameters in subjects with longitudinal systolic dysfunction, a phenomenon that could play an important role in the development of the first stage of LV systolic dysfunction.